CLAIMS

What is claimed is:

1. A method for a user equipment to store information for cell search in a code division multiple access communication system, the system having a plurality of base stations, each base station transmitting a primary synchronization code (PSC) in a primary synchronization channel (PSCH), the method comprising:

a user equipment monitors the PSCH and correlates the PSCH with the PSC;

identifying PSCH locations having a PSC peak using a result of the PSC correlation;

for each identified PSCH location, determining a quality factor comprising a shape factor associated with that location's PSC peak; and

storing for each identified PSCH location, that identified PSCH location and the quality factor.

2. The method of claim 1 wherein the PSCH is divided into repeating frames and each identified PSCH location is a location within a frame time period corresponding to the time period of each frame.

3. The method of claim 1 wherein the frame time period is divided into subframes and the identified PSCH locations are stored with their associate subframes.

4. The method of claim 1 wherein the quality factor comprising a magnitude.

5. The method of claim 1 wherein the shape factor is based on in part a variance of a correlation of the peak location and correlations of neighboring locations.

6. The method of claim 1 wherein the shape factor is based on in part a standard

deviation of a correlation of the peak location and correlations of neighboring locations.

7. The method of claim 1 wherein the shape factor is based on in part an arithmetic mean divided by a geometric mean of correlations of neighboring location with respect to the peak location.

8. The method of claim 1 wherein the quality factors are accumulated over a plurality of the frame time periods.

9. The method of claim 8 wherein peaks not present in multiple frames are filtered out of stored PSCH location information.

10. The method of claim 8 wherein the quality factors are accumulated over a fixed number of the frame time periods.

11. The method of claim 8 wherein the quality factors are accumulated until a confidence level in the accumulations are reached.

12. The method of claim 1 wherein each quality factor include a confidence factor representing a confidence in that peak being a true PSC location.

13. The method of claim 1 wherein the confidence factor is based on in part results from previous cell search attempts.

14. The method of claim 1 further comprising using the stored quality factors to determine a most likely PSC location for use in step II of cell search.

15. The method of claim 14 further comprising performing step II of cell search by storing a quality factor including a shape factor for each potential secondary synchronization code.

16. The method of claim 15 wherein the code division multiple access system uses frequency division duplex and the method further comprising performing step III of cell search by storing a quality factor including a shape factor for each potential scrambling code of a broadcast common control channel.

17. The method of claim 14 wherein the code division multiple access system uses time division duplex and the method further comprising performing step III of cell search by storing a quality factor including a shape factor for each potential midamble of a broadcast channel.

18. A user equipment (UE) performing cell search in a code division multiple access communication system, the system having a plurality of base stations, each base station transmitting a primary synchronization code (PSC) in a primary synchronization channel (PSCH), the UE comprising:

a PSC matched filter for correlating the PSCH with the PSC;

a PSC evaluation device for identifying PSCH locations having a PSC peak using a result of the PSC correlation, for each identified PSCH location, for determining a quality factor comprising a shape factor associated with that location's PSC peak; and

a memory for storing for each identified PSCH location, that identified PSCH location and the quality factor.

19. The UE of claim 18 wherein the frame time period is divided into subframes and the identified PSCH locations are stored with their associate subframes.

20. The UE of claim 18 wherein the quality factor comprising a magnitude.

21. The UE of claim 18 wherein the shape factor is based on in part a variance of a correlation of the peak location and correlations of neighboring locations.

22. The UE of claim 18 wherein the shape factor is based on in part a standard deviation of a correlation of the peak location and correlations of neighboring locations.

23. The UE of claim 18 wherein the shape factor is based on in part an arithmetic mean divided by a geometric mean of correlations of neighboring location with respect to the peak location.

24. The UE of claim 18 wherein the quality factors are accumulated over a plurality of the frame time periods and peaks not present in multiple frames are filtered out of stored PSCH location information.

25. A user equipment (UE) performing cell search in a code division multiple access communication system, the system having a plurality of base stations, each base station transmitting a primary synchronization code (PSC) in a primary synchronization channel (PSCH), the UE comprising:

means for correlating the PSCH with the PSC;

means for identifying PSCH locations having a PSC peak using a result of the PSC correlation;

means for each identified PSCH location, for determining a quality factor comprising a shape factor associated with that location PSCH peak; and

means for storing for each identified PSCH location, that identified PSCH location

and the quality factor.

26. The UE of claim 25 wherein the frame time period is divided into subframes and the identified PSCH locations are stored with their associate subframes.

27. The UE of claim 25 wherein the quality factor comprising a magnitude.

28. The UE of claim 25 wherein the shape factor is based on in part a variance of a correlation of the peak location and correlations of neighboring locations.

29. The UE of claim 25 wherein the shape factor is based on in part a standard deviation of a correlation of the peak location and correlations of neighboring locations.

30. The UE of claim 25 wherein the quality factors are accumulated over a plurality of the frame time periods and peaks not present in multiple frames are filtered out of stored PSCH location information.

31. The UE of claim 25 wherein the PSCH is received using an antenna.

32. The UE of claim 25 wherein the PSCH is received using an antenna array.

33. A method for detecting a time location in a periodic signal having an associated period, the method comprising:

monitoring and correlating with the periodic signal a time period of length of the periodic signal period;

identifying time locations in that time period having a correlation peak with the periodic signal;

for each identified peak, determining a quality factor comprising a shape factor associated with that peak;

storing for each identified peak, that identified peak time location and the quality factor; and

using the stored identified peak location and quality factor for each identified peak to determine the time location of the periodic signal.

34. The method of claim 33 wherein the shape factor is based on in part a variance of a correlation of the peak location and correlations of neighboring locations.

35. The method of claim 33 wherein the shape factor is based on in part a standard deviation of a correlation of the peak location and correlations of neighboring locations.

36. The method of claim 33 wherein the shape factor is based on in part an arithmetic mean divided by a geometric mean of correlations of neighboring location with respect to the peak location.